Remarks

Claims 1-20 are pending. Favorable reconsideration is respectfully requested.

The drawings have been objected to. The Examiner has suggested that Figures 1-3 be labled "Prior Art." Figures 1 and 2 have been so labeled in red ink. However, Figure 3 is an illustration of an encapsulated device of the subject invention, and is not prior art. Hence, Figure 3 has not been amended. Withdrawal of the objection to the drawings is solicited.

Claims 1-9 have been rejected under 35 U.S.C. § 103(a) over the "admitted prior art" on pages 1-3 of the specification, in view of Bauer U.S. patent 4,304,749 ("*Bauer*"). Applicants respectfully traverse this rejection.

First, the application section to which the Office refers is the "Description of the Related Art," not "Prior Art." Applicants have made no admission in this respect.

However, even assuming that the portion of the specification to which the Office refers is prior art, the combination with *Bauer* does not teach or suggest the claimed invention.

The present invention is directed to a microfluidics device of an elastomeric portion and a rigid portion, and a process for the preparation thereof. In the past, it has been difficult to assemble such devices. Following assembly, if the seal between microfluidic passages and rigid substrate is not adequate, the fluid passages may leak. Since such devices are used predominately in the biochemical area, for example for analysis of biological fluids, analysis of microbial contaminants in water streams, sperm cell sorting, etc., leakage from the device or contamination of one fluid stream from another cannot be tolerated. Applicants have solved this problem by encapsulating the device in a thermosetting (curable) resin which exhibits volume contraction upon curing. Thus, devices can be encapsulated at atmospheric pressure or low pressures suitable when using curable resins which are liquid. However, due

to the volume contraction of the resin during cure, a modest pressure is asserted between elastomeric portions of the device and between the elastomer(s) and rigid substrates. Thus, an efficient seal is created without the use of high pressure which may distort or close the intricate and very fine microfluidic passages and fluid supply pathways.

Bauer discloses a method of assembling macrofluidic spray devices which are made of plural parts of a rigid plastics material, which may be a thermoset phenolic. The plastic active parts are sealed to each other by placing the parts in an injection mold and injecting under pressure a thermoplastic having a lower melt temperature than the active parts. Upon cooling, the injected thermoplastic shrinks due to the difference between the temperature of the injected thermoplastic and the cooled thermoplastic, sealing the plural active parts to each other. *Bauer* does not disclose, nor does he teach or suggest use of a curable resin for this purpose; only conventional thermoplastics are disclosed, nor does *Bauer* disclose, teach or suggest active parts which are elastomeric, or any microfluidic device.

Because the subject invention devices are microfluidic devices, they have exceptionally small passageways, measured in μm, of elastomeric material. The use of high pressure injection molding as disclosed by *Bauer* would result in distorting or even blocking the narrow, delicate passages of such devices. Moreover, injection molding of thermoplastic requires that the thermoplastic be injected above its melt temperature. The heat released upon contacting the elastomeric portions of a microfluidics device may cause the same defects as encountered by baking of such devices, including degradation of the elastomer, outgassing, and destruction of microfluidic passage surface treatments.

Thermoplastics necessarily show shrinkage when cooling from above their melt temperature to room temperature. However, such thermoplastics are "thermoplastic," they are not curable, as required by the claims. Moreover, curable thermosetting resins may exhibit volume contraction, volume expansion, or no volume change upon curing, depending upon the monomers used, their curing mechanism, etc. In Applicants' invention, thermosets are used which, when curing, exhibit volume contraction.

Since *Bauer* does not disclose, teach or suggest microfluidics devices or the use of curable resins, *Bauer* cannot render the subject invention obvious. Moreover, there is no evidence of record which supports the combination of *Bauer* with the subject application disclosure. One skilled in the art of microfluidic devices having elastomeric components would not look to an injection molding for the solution of a sealing problem. Withdrawal of the rejection of the claims under 35 U.S.C. § 103(a) is solicited.

New claim 20 has been added to more particularly point out a preferred embodiment wherein the encapsulating resin is poured over the components to be encapsulated. Support may be found in the second paragraph of page 8.

Applicants submit that the claims are now in condition for Allowance, and respectfully request a Notice to that effect. If the Examiner believes that further discussion will advance the prosecution of the Application, she is highly encouraged to telephone Applicants' attorney at the number given below.

Respectfully submitted,

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By _____

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Amendments to the Drawings:

A copy of sheet 1 of the drawings showing proposed changes in red ink to Figures 1 and 2 is attached hereto.

Attachment: Annotated Sheet Showing Changes